

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-2 and 4-5 are pending in the application. Claims 1-2 and 4-5 are amended, and Claim 3 is canceled without prejudice or disclaimer by the present amendment. Claim 1 is amended to incorporate the subject matter of canceled Claim 3, and Claim 4 is amended to be in independent form by incorporating the subject matter of Claim 1. The claims are additionally amended to correct cosmetic matters of form and minor informalities. No new matter is presented.

In the outstanding Official Action, Claims 1-5 were rejected under 35 U.S.C. §101, as directed to non-statutory subject matter; Claim 4 was objected to because of a minor informality; Claims 1-3 were rejected under 35 U.S.C. §103(a) as unpatentable over Hakkinen et al. (U.S. Patent 6,282,185, hereinafter “Hakkinen”) in view of Derryberry et al. (U.S. Patent 6,728,307, hereinafter “Derryberry”); and Claims 4-5 were objected to as dependent upon a rejected base claim, but would be allowable if rewritten to overcome the 35 U.S.C. §101 rejection, and if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Applicants appreciatively acknowledge the indication of allowable subject matter. In response, independent Claim 4 is amended to be in independent form by incorporating the subject matter of Claim 1, from which it depends. Additionally, as discussed below, the pending claims are amended to overcome the rejection thereto under 35 U.S.C. §101.

Accordingly, Applicants respectfully request that the objection to Claim 4 be withdrawn.

The outstanding Official Action rejected Claims 1-5 under 35 U.S.C. §101, as directed to non-statutory subject matter. Specifically, the Official Action states that “the claimed

invention does not fall within at least one of the four categories of patent eligible subject matter...”

In response, Claims 1-2 and 4-5 are amended to recite a “method for performing multi-carrier CDMA transmission...,” and the features of these claims are each amended to respectively recite method steps. Therefore, the present claims are directed to statutory subject matter (e.g., a method or process).

Accordingly, Applicants respectfully request that the rejection of Claims 1-2 and 4-5 under 35 U.S.C. §101 be withdrawn.

The outstanding Official Action objected to Claim 4 because of a minor informality. In response, Claim 4 is amended as requested to recite “the user-specific pilot symbol” instead of “the individual pilot symbol.”

Accordingly, Applicants respectfully request that the objection to Claim 4 be withdrawn.

Claims 1-3 were rejected under 35 U.S.C. §103(a) as unpatentable over Hakkinen in view of Derryberry. Applicants respectfully submit that amended independent Claim 1 recites novel features clearly not taught or rendered obvious by the applied references.

As noted above, Claim 1 is amended to recite the subject matter of canceled Claim 3. Specifically, amended independent Claim 1 recites a method for performing multi-carrier CDMA transmission, comprising:

...inserting, into the transmitted data, a pilot symbol for estimating a variation of a channel and performing synchronous detection, the pilot symbol comprising a common pilot symbol for the purpose of estimating a channel common to each user, and a user-specific pilot symbol that performs communication in a channel different from the channel common to each user, wherein

the pilot symbols are orthogonal on the spread frequency axis, and pilot symbol sequences are orthogonal on a time axis.

In an exemplary embodiment, as shown at Fig. 7 and disclosed at pp. 10-11 of the specification, at each time t (for example, t_1) the pilot symbols JOINT (0000), #1 (1010), #2 (1100), and #3 (1001) are mutually orthogonal. Similarly, the symbol sequences are mutually orthogonal in sequence along the time axis. For example, for the frequency f_1 in Fig. 7, the symbol sequences t_1 (0111), t_2 (0010), t_3 (0100) and t_4 (0001) are mutually orthogonal.

In addressing the features of independent Claim 1, the outstanding Official Action admits that Hakkinen fails to teach or suggest the use of a pilot symbol, or any of the claimed features associated therewith. In an attempt to cure this deficiency, the Official Action cites Derryberry and states that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references to arrive at Applicant's claims.

In addressing the features of original Claim 3, now incorporated into independent Claim 1, the Official Action relies on Hakkinen. Applicants, however, respectfully submit that Hakkinen fails to teach or suggest that "*the pilot symbols are orthogonal on the spread frequency axis, and pilot symbol sequences are orthogonal on a time axis,*" as recited in amended independent Claim 1.

In addressing the above emphasized claimed feature, the Official Action relies on Fig. 2 and col. 4, line 65-col. 5, line 23 of Hakkinen. The cited portion of Hakkinen describes that subcarriers are hopped by changing the frequency of the modulating subcarrier of each spread-coded signal in a predetermined manner. This allows the signals to be separated from one another upon reception according to the way in which subcarrier frequency hopping takes place.

Thus, Hakkinen simply describes a method for increasing the likelihood of detecting a spread-coded signal by hopping the modulated subcarrier in a predetermined manner. At no point does Hakkinen describe that the pilot symbols are orthogonal on the spread frequency axis, and pilot symbol sequences are orthogonal on a time axis, as recited in amended independent Claim 1.

Further, Derryberry was not relied upon to address this claimed feature. Nonetheless, Derryberry also fails to teach or suggest that his broadcast common pilot and dedicated auxiliary pilot share the relationship required in amended independent Claim 1.

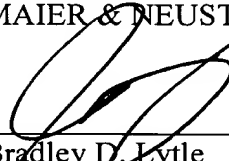
Thus, neither Hakkinen, nor Derryberry, neither alone, nor in combination, teach or suggest "inserting, into the transmitted data, a pilot symbol... comprising a common pilot symbol for the purpose of estimating a channel common to each user, and a user-specific pilot symbol that performs communication in a channel different from the channel common to each user," and that "*the pilot symbols are orthogonal on the spread frequency axis, and pilot symbol sequences are orthogonal on a time axis*," as recited in amended independent Claim 1.

Accordingly, Applicants respectfully request that the rejection of Claim 1 (and Claim 2, which depends therefrom) under 35 U.S.C. §103(a) be withdrawn.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1-2 and 4-5 is definite and patentably distinguishing over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested.

Respectfully submitted,

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